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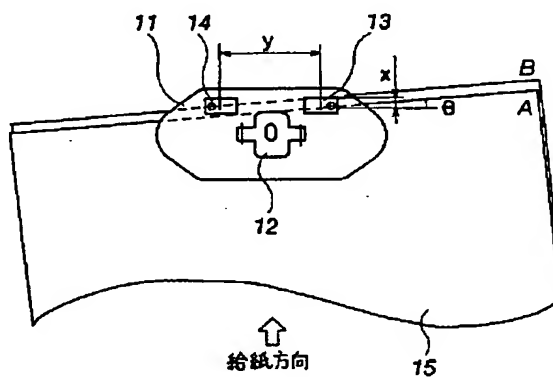
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(54)【発明の名称】 印字装置の用紙斜め検出方法

(57)【要約】

【目的】 用紙の紙送り方向と同方向の用紙の端面位置を、用紙の紙送り方向と垂直方向の異なる2つのセンサで検出することで、用紙の斜め度合いを検出する。

【構成】 用紙15の紙送り方向と同方向の用紙の端面位置を、用紙の紙送り方向と垂直方向の異なる2つのセンサ13、14で検出することが可能で用紙の紙送り速度または用紙の紙送り量が制御可能な印字装置において、用紙が挿入される場合にはセンサが用紙無しから用紙有りとなるタイミングの差、用紙が排出される場合にはセンサが用紙有りから用紙無しとなるタイミングの差を2つのセンサで比較し、モータの用紙の紙送り速度または紙送り量を含めて計算することにより、用紙の斜め度合い $\theta$ を検出できることを特徴としている。



## 【特許請求の範囲】

【請求項1】 用紙の紙送り方向と同方向の用紙の端面位置を検出するために用紙の端面位置を検出するセンサを用紙が挿入される用紙経路上に用紙の紙送り方向と垂直方向に2つ搭載している印字装置において、用紙が挿入される場合にはセンサが用紙無しから用紙有りとなるタイミングの差、用紙が排出される場合にはセンサが用紙有りから用紙無しとなるタイミングの差を2つのセンサで比較し、モータの用紙送り速度を含めて計算することにより、用紙の斜め度合いを検出できることを特徴とする印字装置の用紙斜め検出方法。

【請求項2】 請求項1の2つのセンサが用紙の紙送り方向と垂直方向に移動可能で、挿入される用紙の紙幅を検出する機構を備えた印字装置において、用紙の挿入位置などの関係で請求項1の2つのセンサの両方又は片方が、用紙が挿入される場合には用紙無しから用紙有りとならなかったり、用紙が排出される場合には用紙有りから用紙無しにならなかった場合に用紙の幅を検出し、用紙挿入時には2つのセンサが用紙無しから用紙有りに、用紙排出時には用紙有りから用紙無しになる位置に2つのセンサを用紙の紙送り方向と垂直な方向に移動し、請求項1と同じ処理を行うことで用紙の斜め度合いを検出できることを特徴とする印字装置の用紙斜め検出方法。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は印字装置の用紙斜行の検出方法に関する。

## 【0002】

【従来の技術】従来の用紙斜め検出方法は、用紙の紙送り方向と垂直方向の用紙の右端又は左端の位置を検出できる印字装置において、用紙の右端又は左端を基準の位置からの距離として検出し、一定量用紙送りを実行しその後また用紙の右端又は左端の位置を検出して、先に検出した用紙の右端又は左端の位置との差と用紙送り量を含めて計算することで、用紙の斜め度合いを検出するものであった。

## 【0003】

【発明が解決しようとする課題】しかし、かかる従来の用紙斜め検出方法では、用紙幅を検出するためには通常1回で良いはずの用紙の右端または左端の検出動作を2回行なわなければならない、印字開始から終了までの印字時間に用紙の端面の読み込み動作が1回分余計に加えられていたため、通常の印字時間より長くなっていたことや、2回目の用紙端面の読み込み動作は印字が用紙の途中まで行なわれてから実施されていたため、用紙の斜め検出ができるまでに時間がかかっていた事、更に印字途中で用紙の斜め検出ができ印字を止めても印字された用紙が無駄になることや、今まで印字されてきた文章も途中で印字されて終わりにになってしまうため、新たに文章を最初から印字し直さなければならないという不具合

があった。

【0004】そこで本発明は、従来のこのような問題点を解決するため、用紙の斜め検出が用紙の挿入直後に検出できる用紙の斜め検出方法を提供することを目的とする。

## 【0005】

【課題を解決するための手段】上記課題を解決するため本発明の用紙斜め検出方法は、用紙の紙送り方向と同方向の用紙の端面位置を検出するために用紙の端面位置を検出するセンサを用紙が挿入される用紙経路上に用紙の紙送り方向と垂直方向に2つ搭載している印字装置において、用紙が挿入される場合にはセンサが用紙無しから用紙有りとなるタイミングの差、用紙が排出される場合にはセンサが用紙有りから用紙無しとなるタイミングの差を2つのセンサで比較し、モータの用紙送り速度を含めて計算することにより、用紙の斜め度合いを検出できることを特徴とする。また、2つのセンサが用紙の紙送り方向と垂直方向に移動可能で、挿入される用紙の紙幅を検出する機構を備えた印字装置において、用紙の挿入位置の関係で2つのセンサの両方又は片方が、用紙が挿入される場合には用紙無しから用紙有りとならなかったり、用紙が排出される場合には用紙有りから用紙無しにならなかった場合に用紙の幅を検出し、用紙挿入時には2つのセンサが用紙無しから用紙有りに、用紙排出時には用紙有りから用紙無しになる位置に2つのセンサを用紙の紙送り方向と垂直な方向に移動して、請求項1と同じ処理を実行し用紙の斜め度合いを検出する。

## 【0006】

【作用】上記の様に構成された用紙斜め検出方法において、2つのセンサ間の用紙の紙送り方向と垂直な方向の距離と2つのセンサが用紙挿入時に用紙無しから用紙有りとなるタイミングの差、又は用紙排紙時に用紙有りから用紙無しとなるタイミングの差を用紙の紙送り速度または用紙の紙送り量を含めて計算・比較する事で用紙の傾き角度が計算できる。

## 【0007】

【実施例】以下に本発明の実施例を図面に基づいて説明する。図1に、本発明の実施例をプリンタ装置に応用した上面図を示す。用紙2はバルスモータにより駆動される回転円筒体のプラテン1によって図の上方に送られるため、用紙送り量が制御可能である。キャリッジ4はバルスモータ6の駆動力がベルト8を介して伝達されることで駆動され、前記プラテン1と平行に配置されたガイド軸9上を移動しながら、前記キャリッジ4に搭載された印字ヘッド5により用紙2に印字を行なう。前記キャリッジ4には印字ヘッド5の他にプラテンと紙面の光学的反射率が異なることを利用して用紙の有無を検出できるフォトリフレクタセンサ3が前記キャリッジ4上のマスクホルダ7の左右に2個取り付けられており、用紙が挿入および排出される際にこのセンサ上を用紙が通過す

ることで、用紙の上端位置または下端位置を検出できる構造になっている。また、前記キャリッジ4は前記ガイド軸9上を左右に移動できるようになっており、前記フォトリフレクタセンサ3を用いることで用紙2の右端および左端を検出することができ、これより用紙幅を検出することができる。

【0008】図2に本発明の実施例における用紙斜め検出の動作をあらわすフローチャートを示す。まず2つのフォトリフレクタセンサが搭載されているキャリッジをホームポジションへ移動する。一定の速度で用紙を給紙し、マスクホルダの左右に取り付けられている2つのフォトリフレクタセンサが用紙無しから用紙有りになったかを確認する。2つのセンサが両方とも用紙無しから用紙有りになった場合には、2つのセンサ間の紙送り方向と垂直方向の距離と、2つのセンサが用紙無しから用紙有りになるタイミングの差を用紙の給紙速度または用紙の紙送り量を含めて計算することで用紙の斜め度合いを検出することができる。

【0009】一方、1つまたは2つのセンサが両方とも用紙無しから用紙有りにならなかったならば、キャリッジを用紙の紙送り方向と垂直方向に移動しセンサが用紙無しから用紙有りに、または用紙有りから用紙無しになるタイミングから用紙の紙送り方向と垂直な方向の用紙の両端面を検出し、用紙の幅を計算する。次に用紙を一度逆送りし、用紙がセンサから外れる位置まで用紙を戻した後、先に検出した用紙の幅から2つのセンサが両方とも用紙無しから用紙有りになる位置にキャリッジを用紙の紙送り方向と垂直方向に移動し、用紙を再度給紙する。2つのセンサが両方とも用紙無しから用紙有りになった場合には、前述した用紙の斜め度合いの検出処理を行うことで、給紙された用紙の斜め度合いを検出することができる。もし、2つのセンサが両方とも用紙無しから用紙有りにならなかった場合には、給紙された用紙の幅が短すぎるとしてエラーとすれば良い。

【0010】また、2つのセンサ間の用紙の紙送り方向と同方向の距離にズレがある場合、またはセンサの能力のばらつきにより用紙無しから用紙有りになるタイミングにズレがある場合には、そのズレ量をあらかじめ測定して既知の値としておくか、ズレ量がなくなるようにセンサ位置を調整しておけば、用紙の斜め度合いの検出処理を行なう際にこの内容を考慮することで、より正確な用紙の斜め度合いを検出することができる。2つのセンサ間の用紙の紙送り方向と垂直方向の距離のズレは、2つのセンサ間の用紙の紙送り方向と垂直方向の距離を、2つのセンサ間の用紙の紙送り方向と同方向の距離のズレに対して非常に大きくすることで、用紙の斜め検出の計算の都合上無視できる範囲にとどめることができる。

【0011】図3に本発明の用紙斜め検出方法の詳細を示す。マスクホルダ11にフォトリフレクタセンサ①13とフォトリフレクタセンサ②14が搭載されており、

このセンサにより用紙15が給紙方向に送られた場合に用紙無しから用紙有りになり、用紙の紙送り方向と同方向の端面位置を検出することができる。前記フォトリフレクタセンサ①13が前記用紙15により用紙無しから用紙有りになったタイミングが前記用紙15がAの場所にあるときであり、同様に前記フォトリフレクタセンサ②14が前記用紙15により用紙無しから用紙有りになったタイミングが前記用紙15がBの場所にある時で、このタイミングの差と用紙の紙送り速度から計算した用紙の紙送り方向と同方向の距離がxである。また、2つのセンサ間の用紙の紙送り方向と垂直方向の距離をyとするとこのxとyより用紙の傾き角 $\theta$ を計算することができる。

【0012】

【発明の効果】以上説明したように本発明の用紙斜め検出方法では、用紙の紙送り方向と同方向の用紙の端面位置を用紙の紙送り方向と垂直方向の異なる2つのセンサで検出することが可能で、用紙の紙送り速度または紙送り量が制御可能な印字装置であれば、複雑な制御を必要とせず、しかも用紙が給紙された瞬間に用紙の斜め度合いを検出することが可能であり、これにより用紙が設定値以上斜めに給紙された場合には用紙に印字を行わないうちに印字の処理を停止することが可能になることをはじめとして、用紙の無い部分への印字を防止したり、印字自体を途中で中止することができ、印字装置の信頼性を向上させることができる。

【図面の簡単な説明】

【図1】本発明をプリンタ装置に応用した上面図である。

【図2】本発明の実施例における用紙斜め検出方法のフローチャートである。

【図3】本発明の用紙斜め検出方法の詳細を示す図である。

【符号の説明】

- 1 ブラテン
- 2 用紙
- 3 フォトリフレクタセンサ
- 4 キャリッジ
- 5 印字ヘッド
- 6 バルスモータ
- 7 マスクホルダ
- 8 ベルト
- 9 ガイド軸
- 11 マスクホルダ
- 12 リボンマスク
- 13 フォトリフレクタセンサ①
- 14 フォトリフレクタセンサ②
- 15 用紙
- A フォトリフレクタセンサ①が用紙無しから用紙有りになった用紙の位置

5

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B フォトリフレクタセンサ②が用紙無しから用紙有りになった用紙の位置

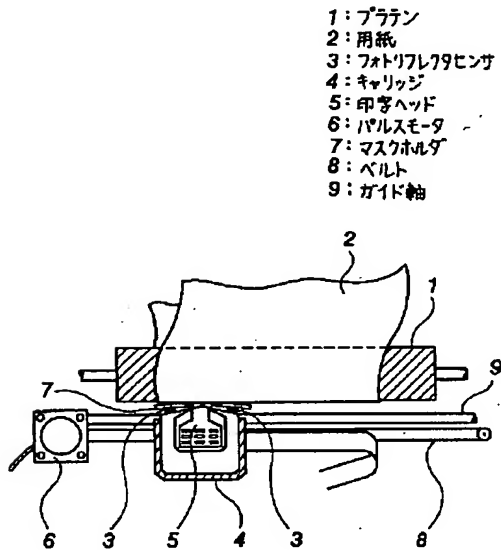
\* y 2つのセンサが両方とも用紙無しから用紙有りになるまでの差

x 2つのセンサ間の用紙の紙送り方向と垂直方向の距離

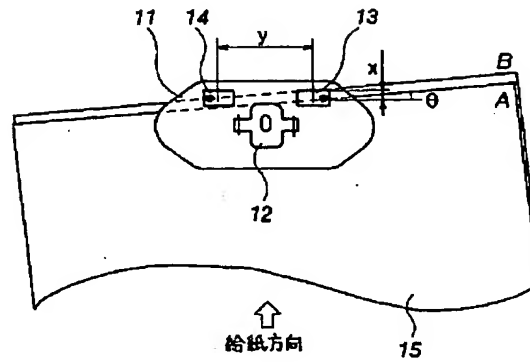
$\theta$  用紙の傾き角

\*

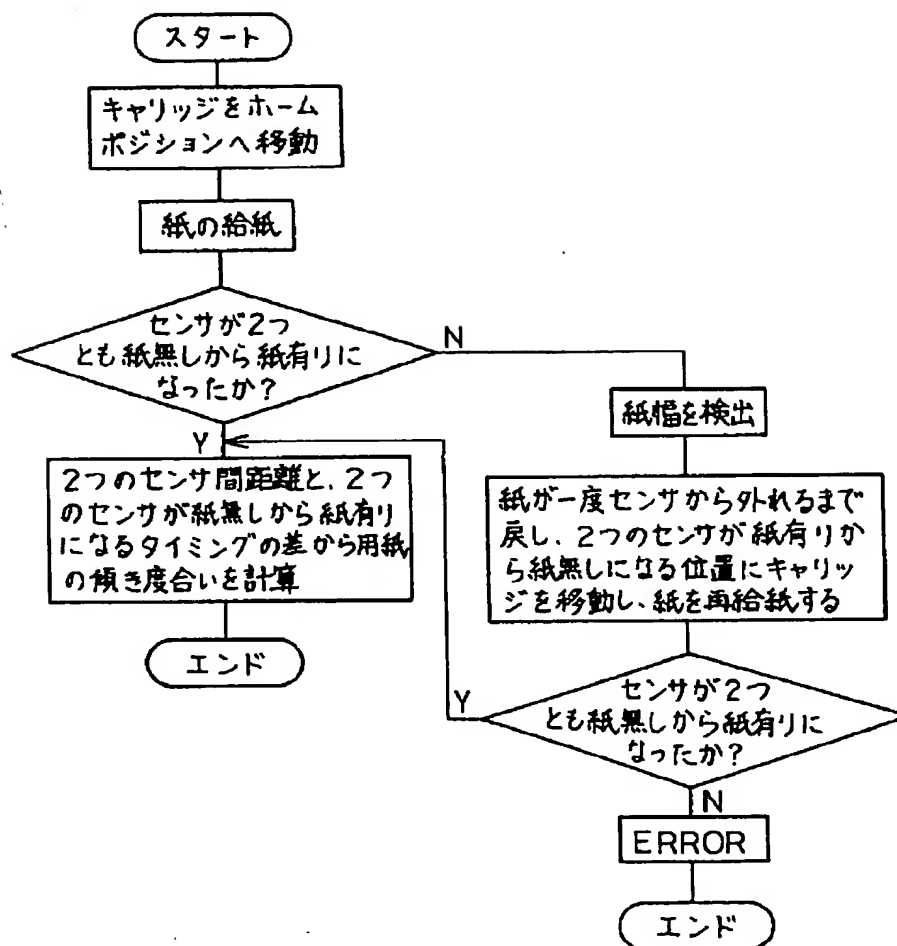
【図1】



【図3】



【図2】



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PATENT ABSTRACTS OF JAPAN

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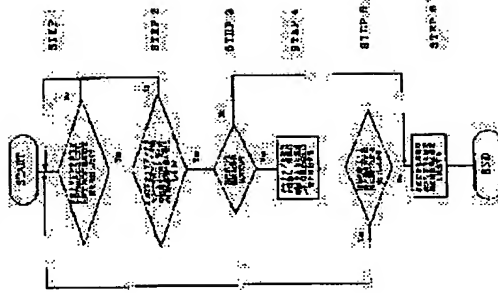
(21)Application number : 06-080671 (71)Applicant : SEIKO EPSON CORP  
(22)Date of filing : 19.04.1994 (72)Inventor : MIYAZAWA SHIGERU

(54) PAPER END SURFACE POSITION DETECTING METHOD OF SERIAL PRINTER

(57)Abstract:

PURPOSE: To accurately detect the position of a paper end surface by moving an optical sensor in the direction vertical to a paper feed direction when the optical sensor detects the position of the paper end surface in order to detect the same in the paper feed direction to confirm the presence of the paper end surface.

CONSTITUTION: It is judged whether a reflection type optical sensor detects the position of a paper end surface in a paper feed direction (step 1) and, only when both of two optical sensors detect the position of the paper end surface in the same direction as the paper feed direction of paper (step 2), the detected position is judged to be high in the possibility of the paper end surface to advance to a step 3. It is confirmed whether paper end surface position detecting operation is effective (step 3) and, in the case of effective, a carriage is moved left and right and the position of the paper end surface in the direction vertical to the paper feed direction is detected (step 4). When the position of the paper end surface in the direction vertical to the paper feed surface is not present in the direction vertical to the paper feed direction, said position is set to a normal paper end surface position (step 6).



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[Date of final disposal for application]  
[Patent number]  
[Date of registration]  
[Number of appeal against examiner's decision]

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CLAIMS

[Claim(s)]  
 [Claim 1] The form end-face position method of detection of the serial printer characterized by determining the aforementioned form end face as a regular form end face when the aforementioned sensor is moved to the direction of an ejection, and a perpendicular direction, the existence of a form is detected in the serial printer which carried the photosensor of the reflex which detects the existence of a form in carriage when the aforementioned sensor detects the form end face of the direction of an ejection, and there is no form in the aforementioned ejection direction and a perpendicular direction.  
 [Claim 2] The form end-face position method of detection of the serial printer according to claim 1 characterized by moving the aforementioned sensor to the aforementioned ejection direction and a perpendicular direction, and detecting the existence of a form only when it has two or more aforementioned sensors and two or more aforementioned sensors detect the form end face of the direction of an ejection simultaneously.  
 [Claim 3] The claim 1 characterized for operation which is made to move the aforementioned sensor to the aforementioned ejection direction and a perpendicular direction, and detects the existence of a form by effective or making it selectable invalid, and the form end-face position method of detection of a serial printer given in two.

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001] [Industrial Application] this invention relates to the form end-face position method of detection of the direction of an ejection of a printer.

[0002]

[Description of the Prior Art] The form end-face position method of detection of the conventional direction of an ejection has determined the position as a form end-face position, when the photosensor which detects the form end face carried on the form path detects the end face of the form conveyed.

[0003]

[Problem(s) to be Solved by the Invention] However, in the form end-face position method of detection of this conventional direction of an ejection, although the photosensor which detects the end-face position of a form reacted also to the black portion currently printed by the form and the punch hole and was in the middle of the form, it detected that the position was a form end-face position of the direction of an ejection, and the problem that a printer malfunctioned had arisen.

[0004] The place which this invention is made in view of such a problem, and makes into the

purpose is located in the place which offers more efficiently the black portion in which the photosensor which detects the end-face position of a form is printed by the form, and the method of determining a regular form end-face position, without detecting the position accidentally with the end-face position of the direction of an ejection even when it reacts to a punch hole and the form end-face position of the direction of an ejection is detected.

[0005]

[Means for Solving the Problem] The form end-face position method of detection of the serial printer of this invention in the serial printer which carried the photosensor of the reflex which detects the existence of a form in carriage When the aforementioned sensor detects the form end face of the direction of an ejection, move the aforementioned sensor to the direction of an ejection, and a perpendicular direction, and the existence of a form is detected. When there is no form in the aforementioned ejection direction and a perpendicular direction, it is characterized [ of a claim 1 ] by determining the aforementioned form end face as a regular form end face.

Only when it has two or more aforementioned sensors and two or more aforementioned sensors detect the form end face of the direction of an ejection simultaneously It is characterized [ of a claim 2 ] by moving the aforementioned sensor to the aforementioned ejection direction and a perpendicular direction, and detecting the existence of a form, and operation which is made to move the aforementioned sensor to the aforementioned ejection direction and a perpendicular direction, and detects the existence of a form is characterized [ of a claim 3 ] by effective or making it selectable invalid.

[0006]

[Function] Even when the photosensor which detects the end-face position of a form reacts to the black portion and punch hole which are printed by the form and detects the form end-face position of the direction of an ejection, a regular form end-face position can be certainly

determined by moving the carriage which carried the photosensor in the direction of a digit, and judging the existence of the form of the direction of a digit.

[0007]

[Example] The example of this invention is explained based on a drawing below. Drawing 1 is the plan which applied the example of this invention to printer equipment. A form 2 is sent by the platen 1 of the turning-circle barrel driven by the stepping motor above the drawing. Carriage 4 is driven by the driving force of a stepping motor 6 being transmitted through a belt 8, and it prints in a form 2 by the print head 5 carried in the aforementioned carriage 4, moving in the guide shaft 9 top arranged in parallel with the aforementioned platen 1. The photograph reflector sensor 3 which can detect the end-face position of a form using the optical reflection factors of a platen and space other than a print head 5 differing on the aforementioned carriage 4 is attached in two right and left of the mask holder 7 on the aforementioned carriage 4, and it has the structure where of the upper-limit position or the soffit position of the direction of an ejection of a form 2 is detectable because a form passes through this sensor top in case a form is inserted and discharged. Moreover, since the aforementioned carriage 4 can move the aforementioned guide shaft 9 top to right and left, the right end position and left end position of the direction of an ejection of a form 2 and a perpendicular direction are detectable by using the aforementioned photograph reflector sensor 3.

[0008] Drawing 2 is a flow chart which shows form end-face position detection operation of the direction of an ejection in the example of this invention. First, it judges whether the photograph reflector sensor detected the form end-face position of the direction of an ejection at Step 1. It progresses to the following step 3 noting that possibility that the position is a form end face is high, only when it judges whether the photograph reflector sensor of another side detected the form end-face position of the direction of an ejection at Step 2 when the photograph reflector sensor had detected the form end-face position of the direction of an ejection and both photograph reflector sensors have detected the form end-face position of the direction of an ejection. On the other hand, when only one of the two's photograph reflector sensor has detected the form end-face position of the direction of an ejection at Step 2, the position reacted to the black portion and punch hole which are printed by the form, is judged, and returns to Step 1.

[0009] When both photograph reflector sensors have detected the form end-face position of the direction of an ejection at Step 2, it checks whether form end-face position detection operation of the direction of an ejection "is effective" at Step 3, and when "effective", carriage is first moved to right and left at Step 4, and the form end-face position of the direction of an ejection and a perpendicular direction is detected. When the form end-face position of the direction of an ejection and a perpendicular direction is detected here, the form exists in the direction of an ejection, and the perpendicular direction, and two photograph reflector sensors react to the black portion and punch hole which are printed by the form, and it returns to Step 1 noting that it is incorrect detection.

[0010] On the other hand, since there is no form in the direction of an ejection, and a

perpendicular direction when the form end-face position of the direction of an ejection and a perpendicular direction is not detected, let the position be a regular form end-face position (Step 6).

[0011] When form end-face position detection operation is an "invalid" at Step 3, form end-face position detection operation is not performed, but it flies to Step 6, and let this detection position be the form end-face position of the direction of an ejection.

[0012] Drawing 3 is drawing showing the detail of the form end-face position method of detection of the direction of a form ejection of this invention. Photograph reflector sensor #13 and photograph reflector sensor #14 are carried in the mask holder 11, and when a form 15 is sent in the direction of an ejection by this sensor, the form end-face position of the direction of an ejection can be detected. First, the aforementioned form 15 is sent in the direction of an ejection, and the case where the black printing band on the form in the place of A of a form 15 passes the aforementioned photograph reflector sensor #14 is considered. In this case, with the black printing band of A of the aforementioned form 15, although they detect the form end-face



position of the direction of an ejection, since the aforementioned photograph reflector sensor \*\*14 do not require the black printing band of A of the aforementioned form 15 for the aforementioned photograph reflector sensor \*\*13, they do not detect the form end-face position of the direction of an ejection, therefore, since both photograph reflector sensors have not detected the form end-face position of the direction of an ejection, the position is not a form end-face position of the direction of an ejection -- it judges

[0013] Next, the aforementioned form 15 is sent in the direction of an ejection, and the case where the black printing band on the form in the place of B of a form 15 passes the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 is considered. In this case, it distinguishes as which form end-face position detection operation of the direction of an ejection of this invention shall be set between "effective/invalid" noting that possibility that the position is the form end face of the direction of an ejection is high, in order that the sensor of both aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 may detect the form end-face position of the direction of an ejection with the black printing band of B of the aforementioned form 15.

[0014] If form end-face position detection operation of the direction of an ejection of this invention is set as "effective", the aforementioned ribbon mask 11 will be first moved to the direction of an ejection, and a perpendicular direction, and the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 will detect the form end-face position of the direction of an ejection, and a perpendicular direction. In this case, if the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 have started the black printing band of B of the aforementioned form 15 Although the form end-face position of the direction of an ejection and a perpendicular direction is not detected, if either of the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 separates from the black printing band of B of the aforementioned form 15 In order that aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 may recognize that there is a form and may detect the form end-face position of the direction of an ejection, and a perpendicular direction, it is judged that the position is not a form end-face position of the direction of an ejection.

[0015] On the other hand, when form end-face position detection operation of the direction of an ejection of this invention is set as the "invalid" The aforementioned form 15 is sent in the direction of an ejection, and the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 with the black printing band of B of the aforementioned form 15 The position where both sensors detected the form end-face position of the direction of an ejection will detect with the form end-face position of the direction of an ejection, and will detect accidentally in the position which is not an actual form end face.

[0016] Finally, the aforementioned form 15 is sent in the direction of an ejection, and the case where the form end face C of the direction of an ejection of a form 15 passes the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 is considered. In this case, it distinguishes as which form end-face position detection operation of the direction of an ejection of this invention shall be set between "effective/invalid" noting that possibility that the position is the form end face of the direction of an ejection is high, in order that the sensor of both aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 may detect the form end-face position of the direction of an ejection with the form end-face position of C of the aforementioned form 15.

[0017] If form end-face position detection operation of the direction of an ejection of this invention is set as "effective", the aforementioned ribbon mask 11 will be first moved to the direction of an ejection, and a perpendicular direction, and the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 will detect the form end-face position of the direction of an ejection, and a perpendicular direction. In this case, from the form end face of C of the aforementioned form 15, since the aforementioned

photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 have shifted, they do not detect the form end-face position of the direction of an ejection, and a perpendicular direction. For this reason, this operation becoming unnecessary, when there are no black printing band and punch hole as shown in a form at the aforementioned form 15, and the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 cannot detect the form end-face position of the direction of an ejection while being a form, although the position is judged to be the form end-face position of the direction of an ejection, and spending excessive time in detecting the form end-face position of the direction of an ejection.

[0018] On the other hand, when form end-face position detection operation of the direction of an ejection of this invention is set as the "invalid", the aforementioned form 15 is sent in the direction of an ejection, and the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 detect the position where both sensors detected the form end-face position of the direction of an ejection with the form end-face position of the direction of an ejection by the form end face of C of the aforementioned form 15. Therefore, there are no black printing band and punch hole as shown in a form at the aforementioned form 15, and when the aforementioned photograph reflector sensor \*\*13 and the aforementioned photograph reflector sensor \*\*14 cannot detect the form end-face position of the direction of an ejection while being a form, the form end-face position of the direction of an ejection can be detected efficiently.

[0019] [Effect of the Invention] As explained above, even when the photosensor which detects the form end-face position of the direction of an ejection detects the form end-face position of the direction of an ejection in the middle of a form in response to the black printing band and punch hole of a form, since the form end-face position method of detection of the direction of an ejection of this invention moves a photosensor for whether it is the end-face position where the position is regular to the direction of an ejection, and a perpendicular direction and is reconfirmed, exact detection is possible for it.

[0020] The form end-face position method of detection of the direction of an ejection of this invention by moreover, the thing of "effective/invalid" made selectable By making the above-mentioned setup into an "invalid", when there is neither a black printing band nor a punch hole in a form, and there is no possibility of detecting the form end-face position of the direction of an ejection, as the sensor which detects the end-face position of a form is a form In order not to perform form end-face position detection operation of the direction of an ejection of this invention at the time of form end-face position detection of the direction of an ejection, excessive operation will not be performed but the form end-face position of the direction of an ejection can be detected in a short time. on the other hand, as the sensor which a black printing band and a punch hole are in a form, and detects the end-face position of a form is a form, when the form end-face position of the direction of an ejection may be detected In order to perform form end-face position detection operation of the direction of an ejection of this invention by "confirming" the above-mentioned setup at the time of form end-face position detection of the direction of an ejection. Even when the sensor which detects the end-face position of a form detects the form end-face position of the direction of an ejection by the black printing band and punch hole of a form in the middle of a form, the position can detect truly whether it is the end-face position of the direction of an ejection. That is, the form end-face position of the direction of an ejection is efficiently detectable by enabling selection of "effective/invalid."

[Translation done.]

\* NOTICES \*

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The plan of the printer equipment which applies this invention.

[Drawing 2] The flow chart of the example of this invention.

[Drawing 3] Drawing explaining the example of this invention.

[Description of Notations]

- 1 Platen
- 2 Form
- 3 Photograph Reflector Sensor
- 4 Carriage
- 5 Print Head
- 6 Stepping Motor
- 7 Mask Holder
- 8 Belt
- 9 Guide Shaft
- 11 Mask Holder
- 12 Ribbon Mask
- 13 Photograph Reflector Sensor \*\*
- 14 Photograph Reflector Sensor \*\*
- 15 Form

[Translation done.]